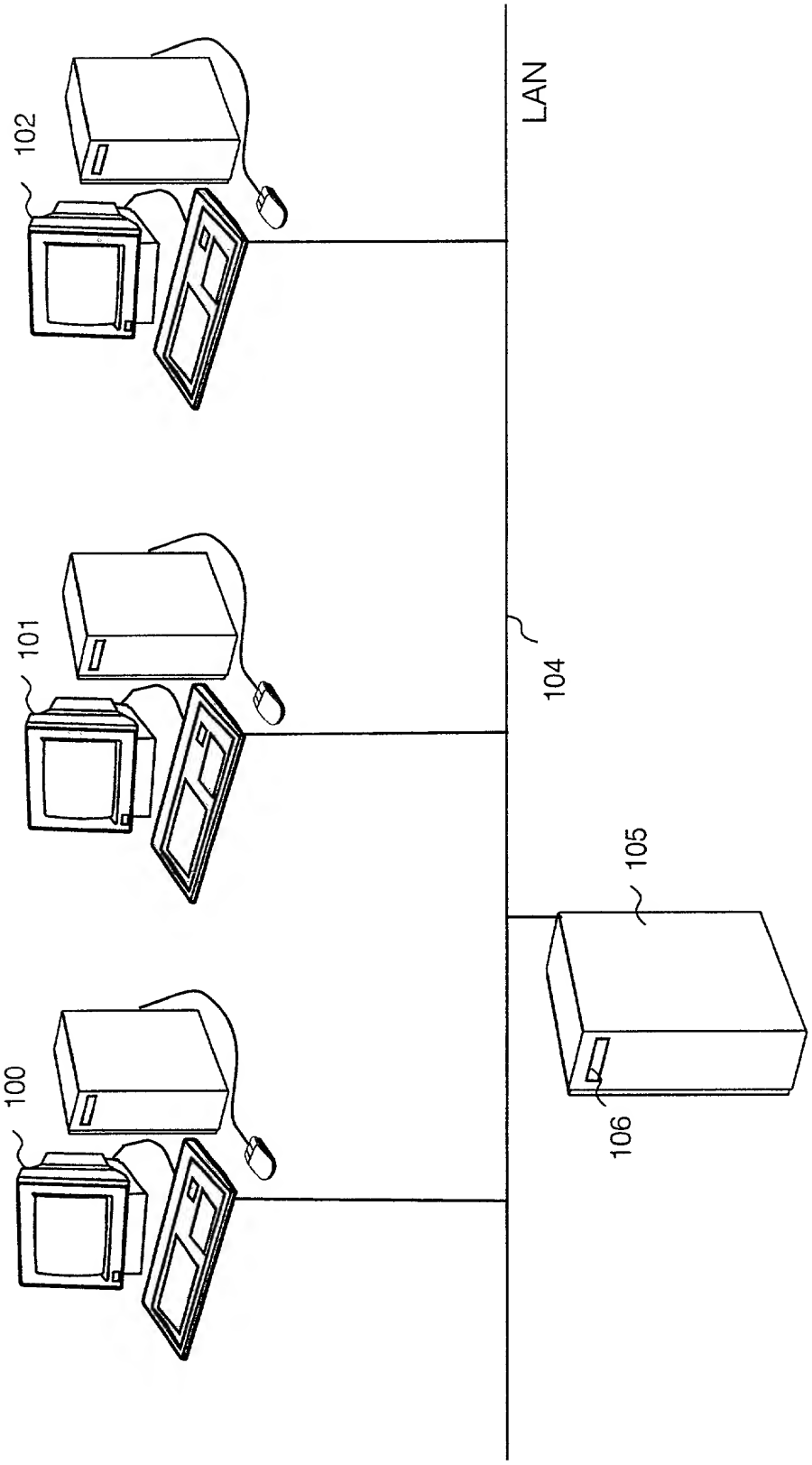


Fig. 1
(Prior Art)

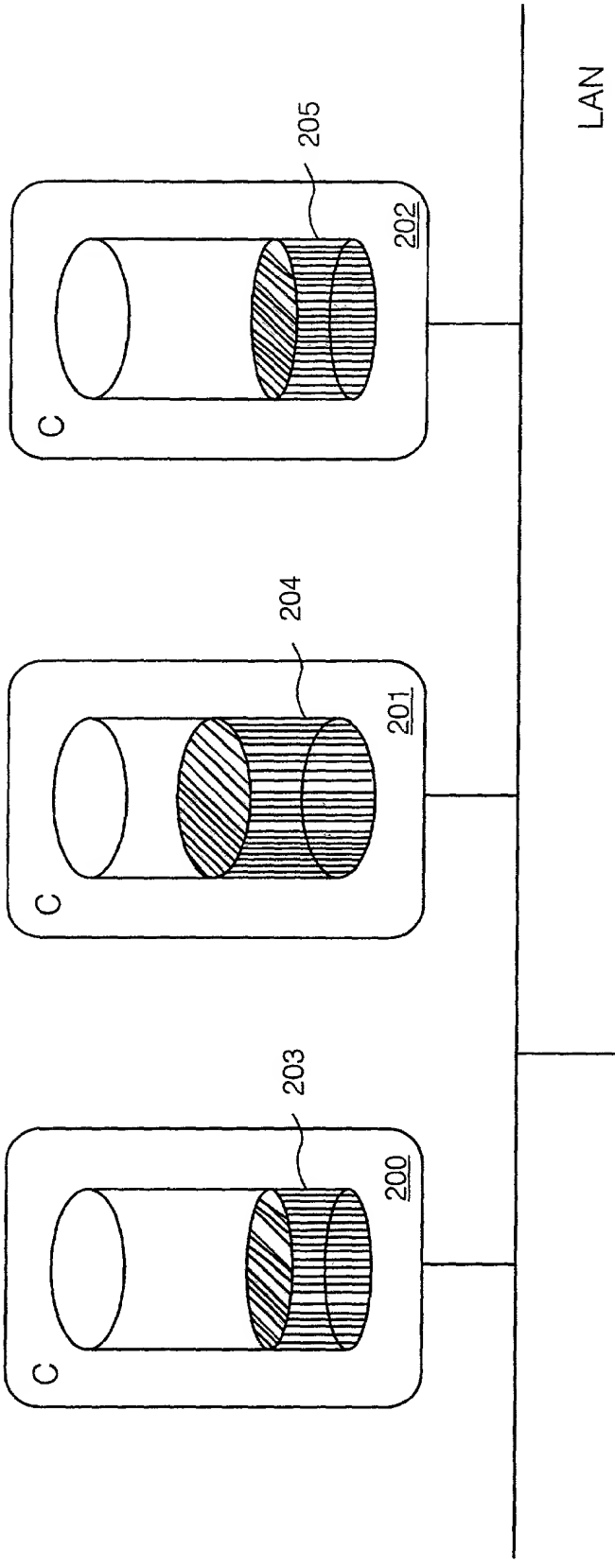


Fig. 2
(Prior Art)

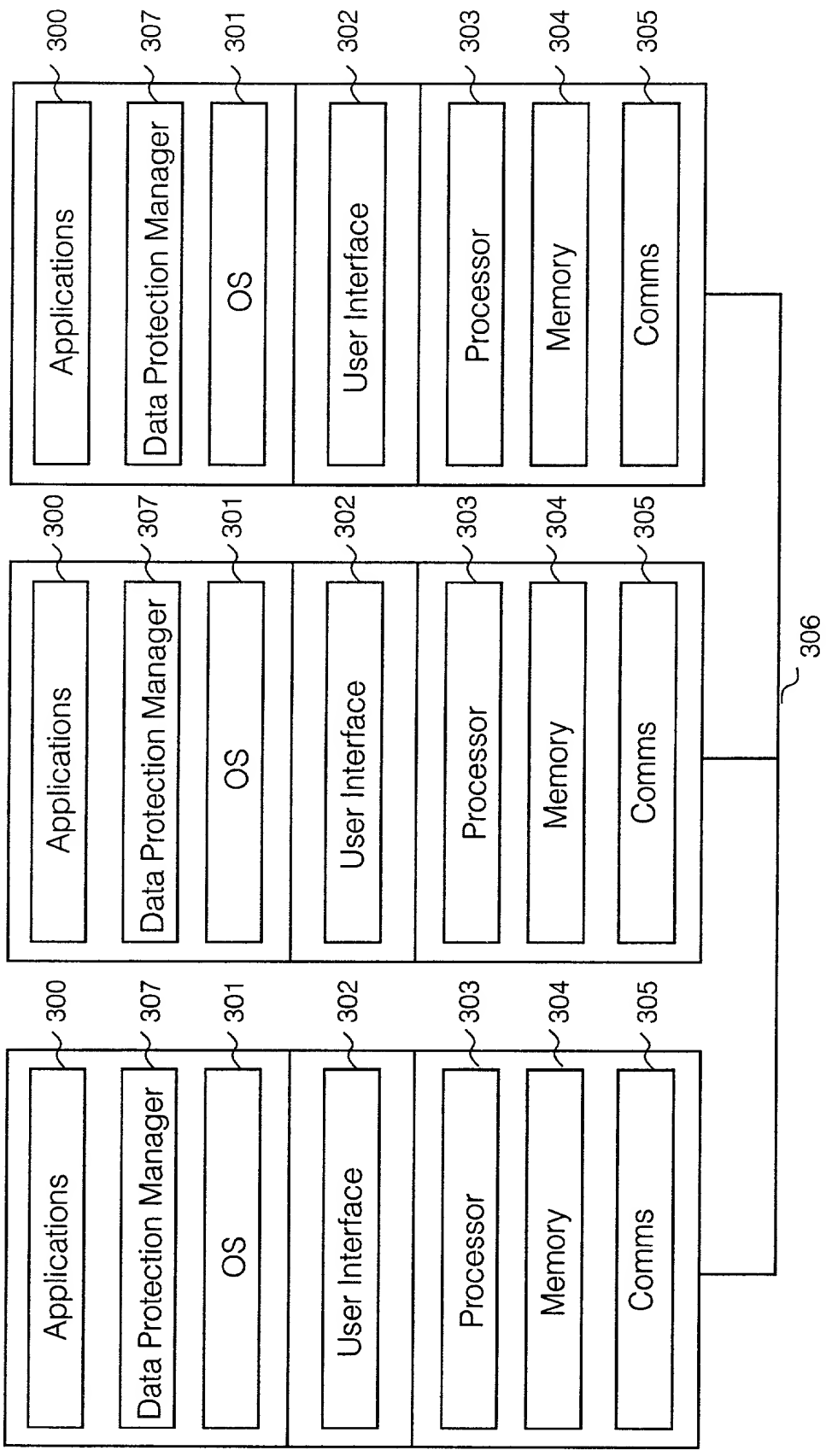

300
307
301
302
303
304
305
Applications
Data Protection Manager
OS
User Interface
Processor
Memory
Comms
306

Fig. 3

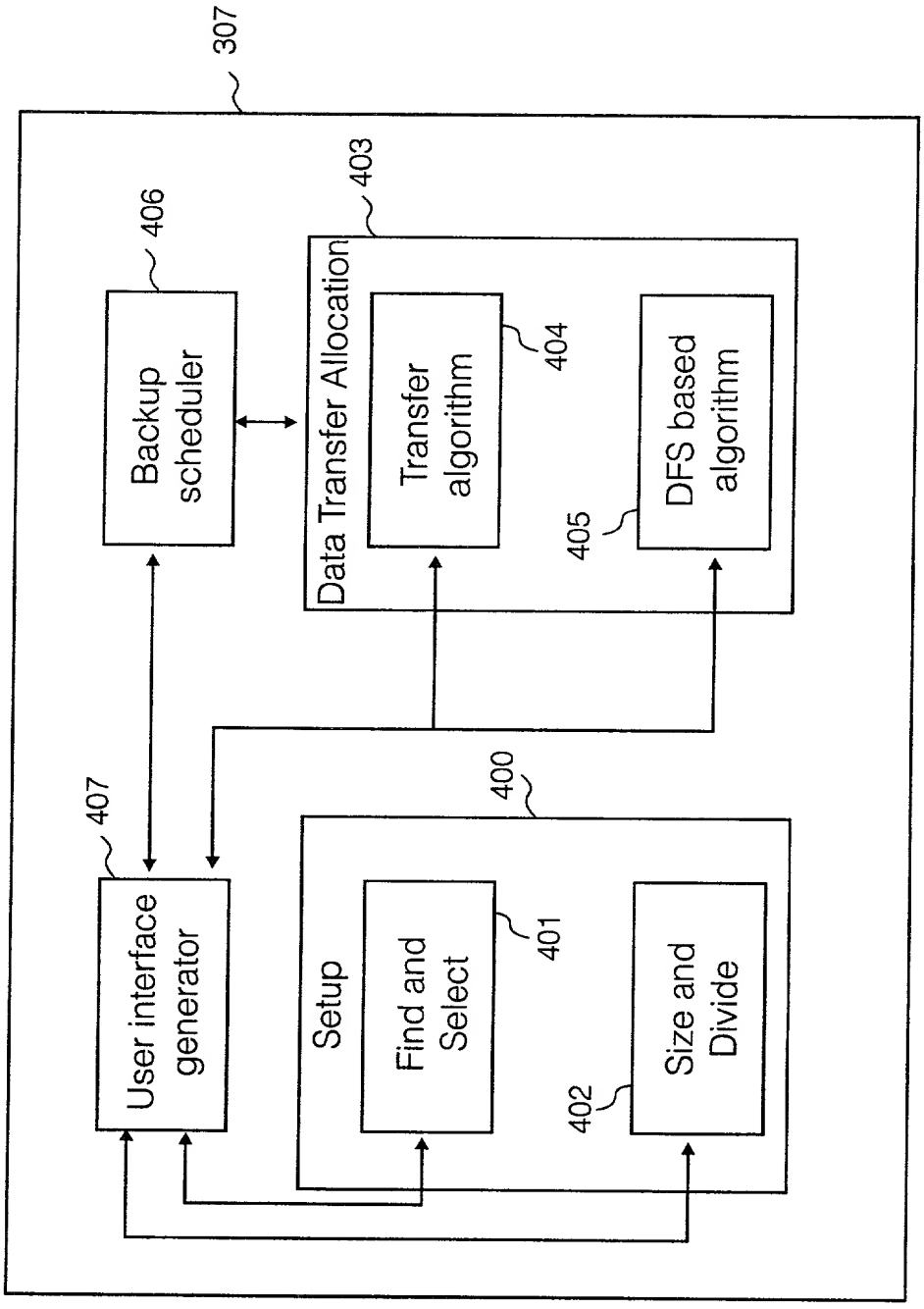

307
403
406
Backup scheduler
Data Transfer Allocation
Transfer algorithm
404
DFS based algorithm
405
400
407
User interface generator
Setup
Find and Select
401
Size and Divide
402

Fig. 4

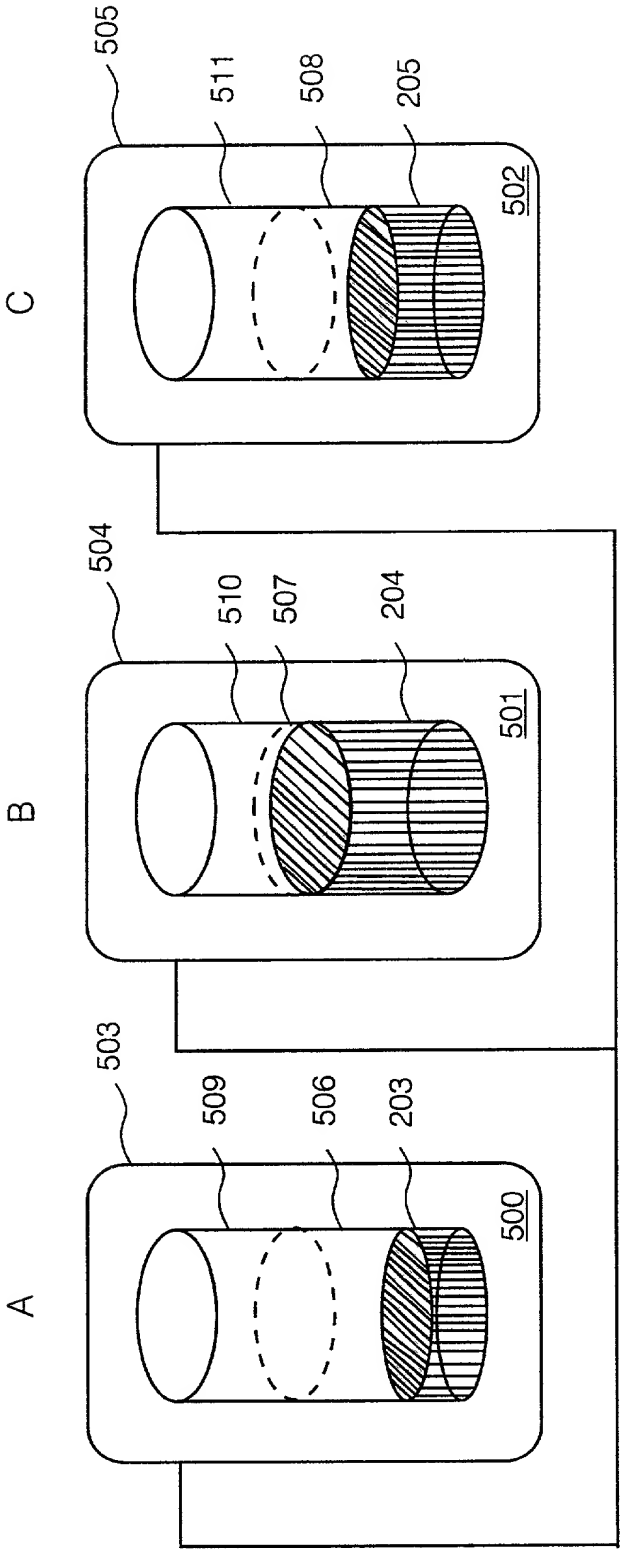


Fig. 5

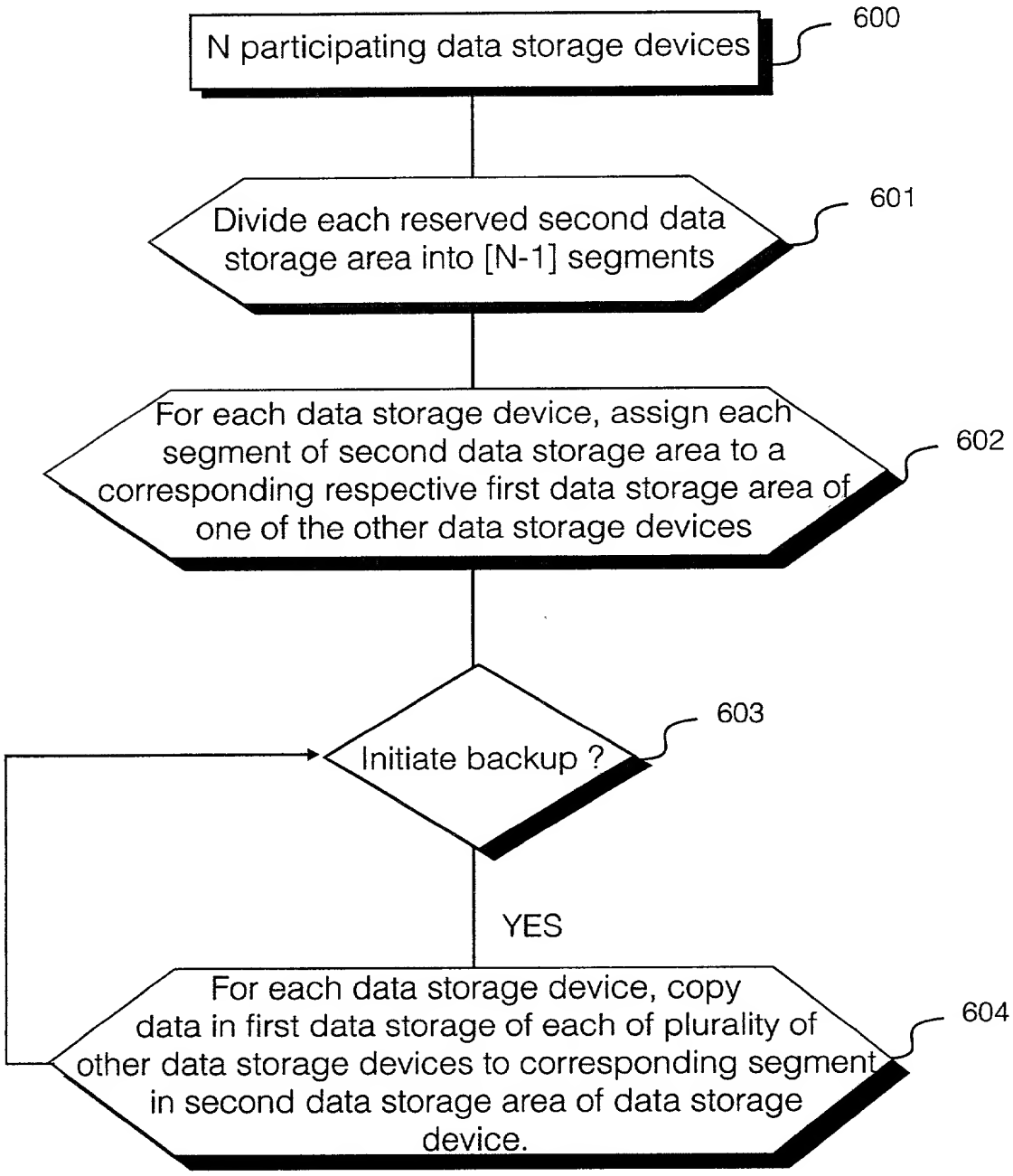

N participating data storage devices
600
Divide each reserved second data storage area into [N-1] segments
601
For each data storage device, assign each segment of second data storage area to a corresponding respective first data storage area of one of the other data storage devices
602
Initiate backup ?
603
YES
For each data storage device, copy data in first data storage of each of plurality of other data storage devices to corresponding segment in second data storage area of data storage device.
604

Fig. 6

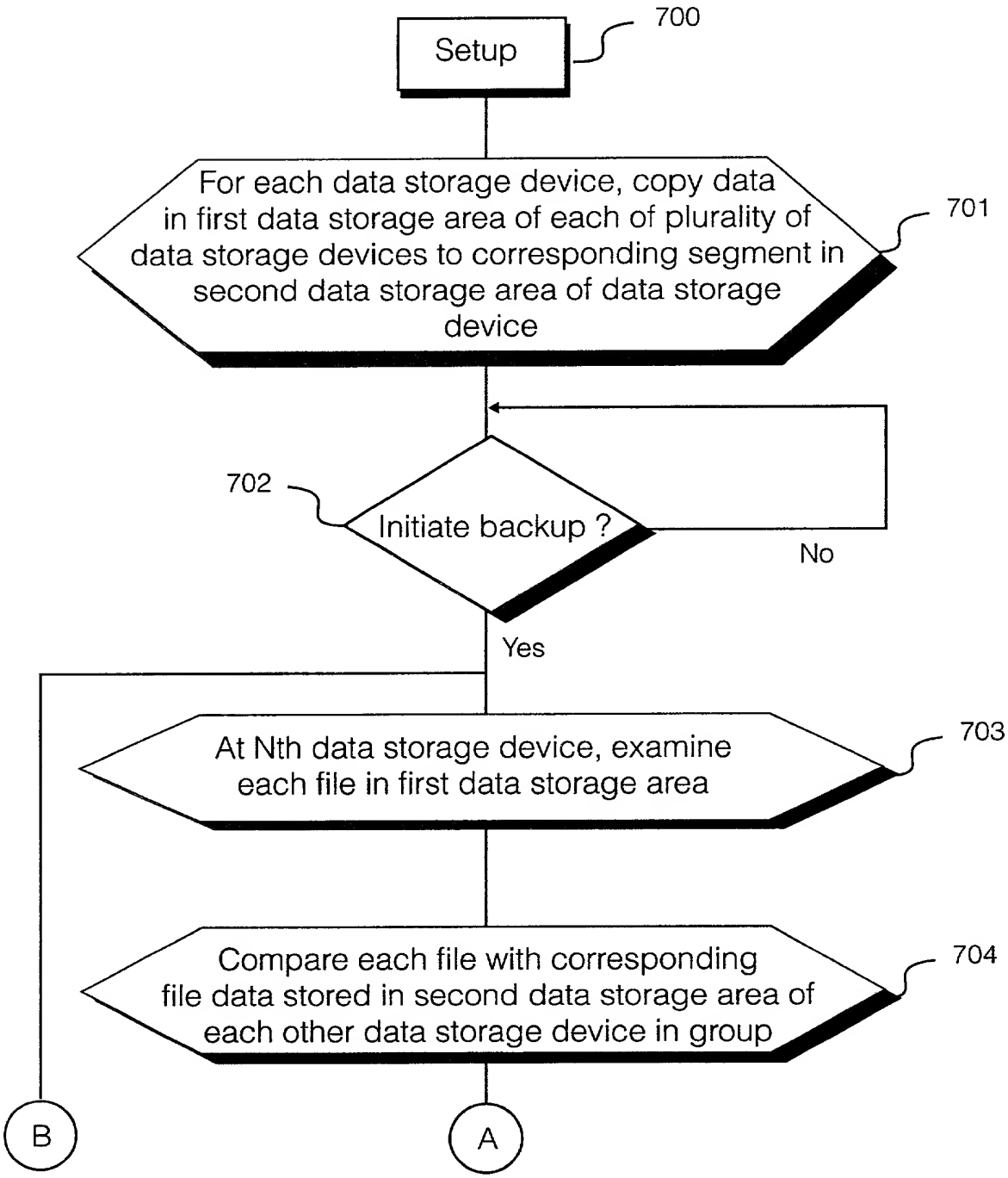

Setup
700
For each data storage device, copy data in first data storage area of each of plurality of data storage devices to corresponding segment in second data storage area of data storage device
701
702
Initiate backup ?
No
Yes
At Nth data storage device, examine each file in first data storage area
703
Compare each file with corresponding file data stored in second data storage area of each other data storage device in group
704
B
A

Fig. 7

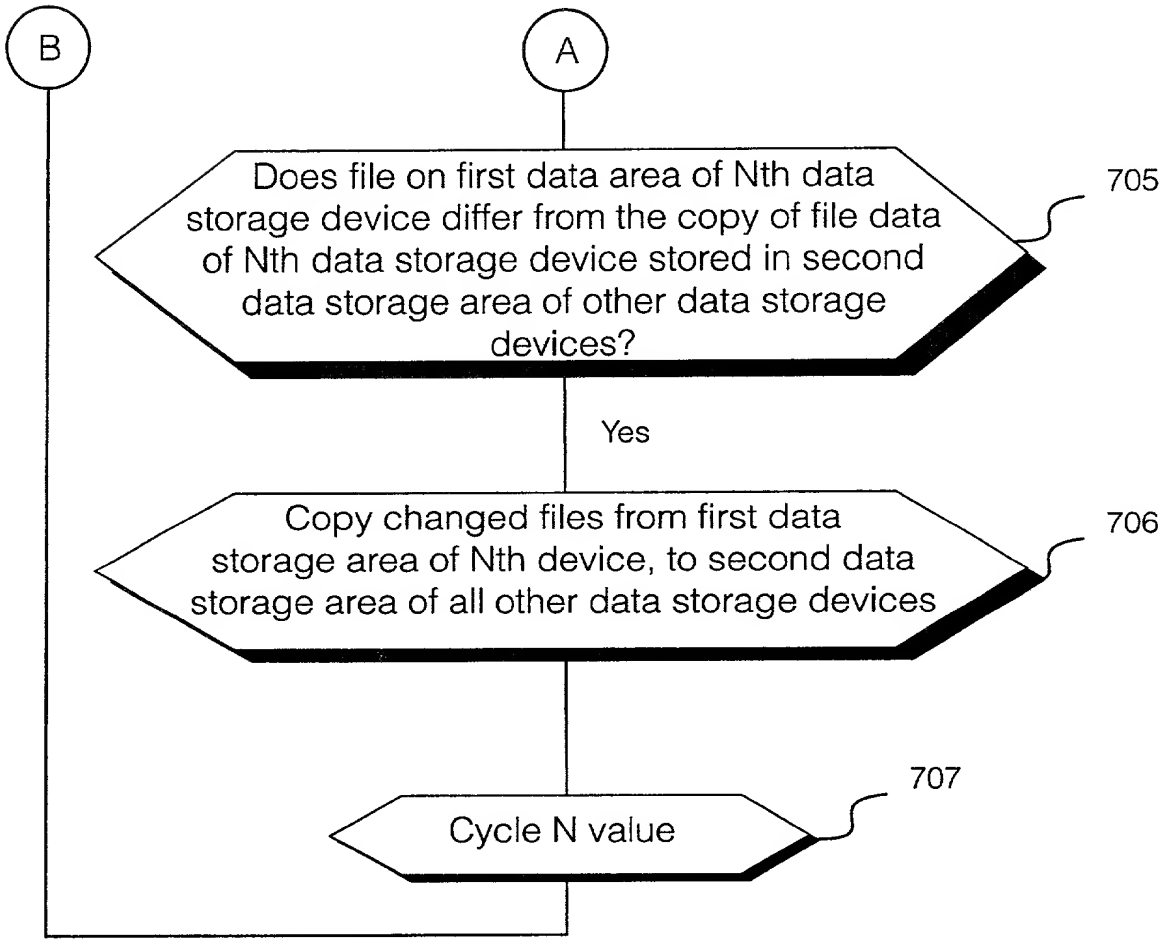

B
A
Does file on first data area of Nth data storage device differ from the copy of file data of Nth data storage device stored in second data storage area of other data storage devices?
705
Yes
Copy changed files from first data storage area of Nth device, to second data storage area of all other data storage devices
706
Cycle N value
707

Fig. 7

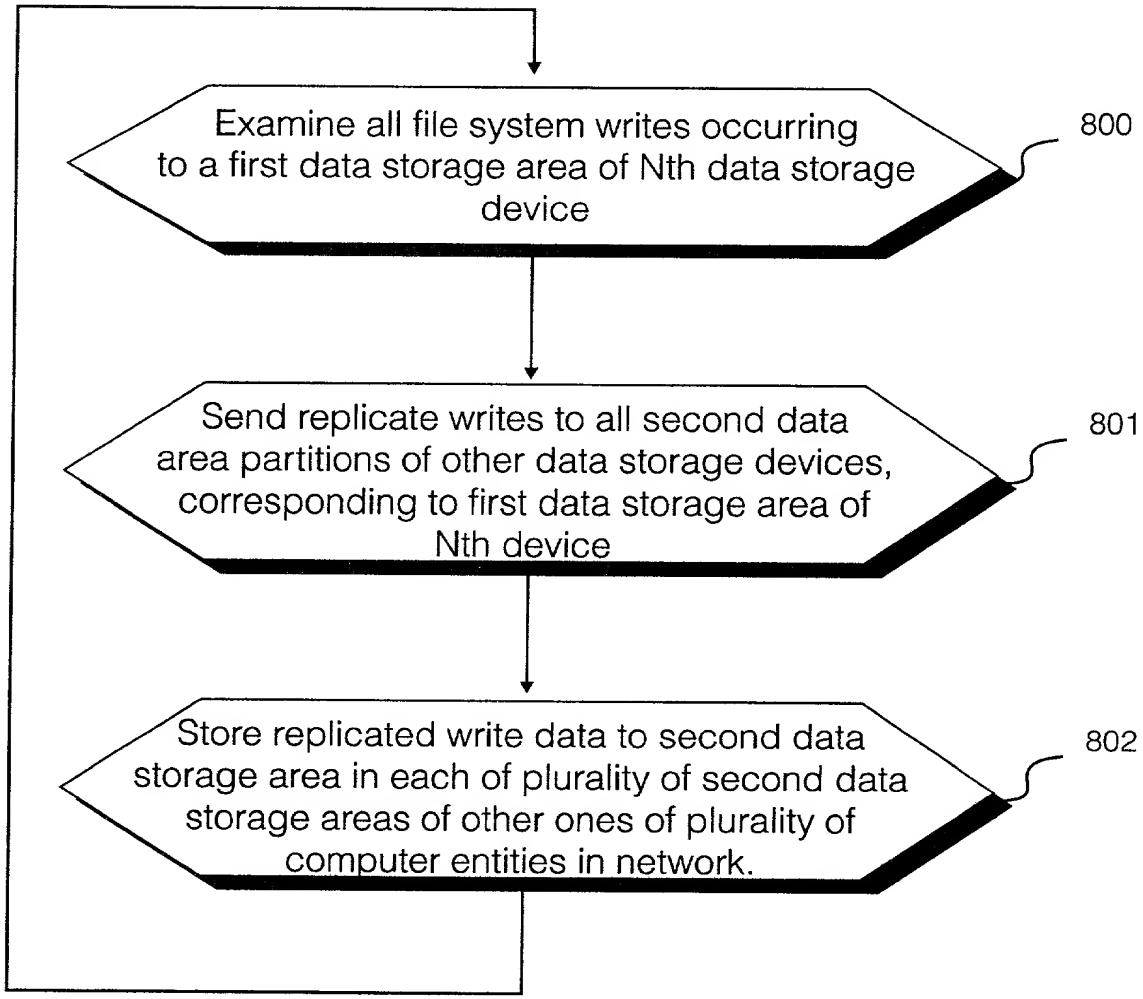

Examine all file system writes occurring to a first data storage area of Nth data storage device
800
Send replicate writes to all second data area partitions of other data storage devices, corresponding to first data storage area of Nth device
801
Store replicated write data to second data storage area in each of plurality of second data storage areas of other ones of plurality of computer entities in network.
802

Fig. 8

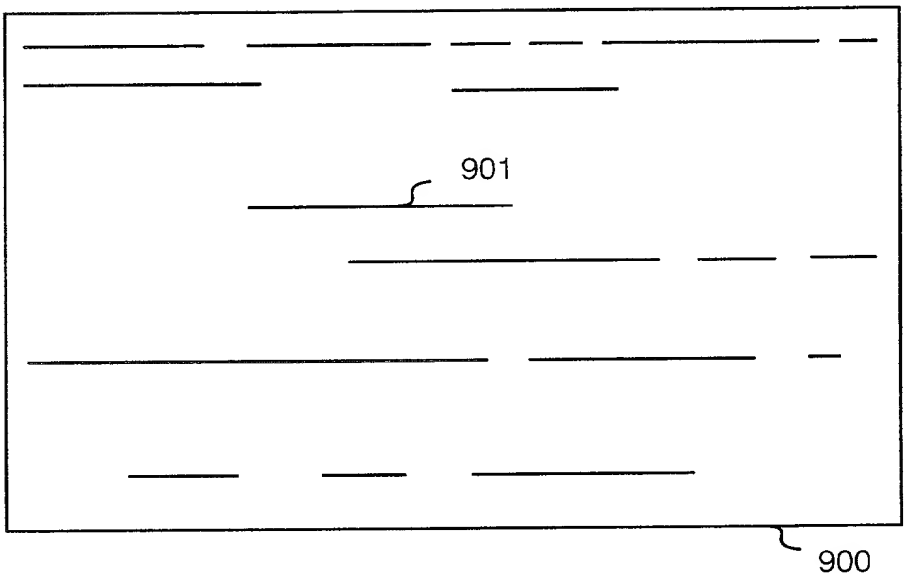

901
900

Fig. 9

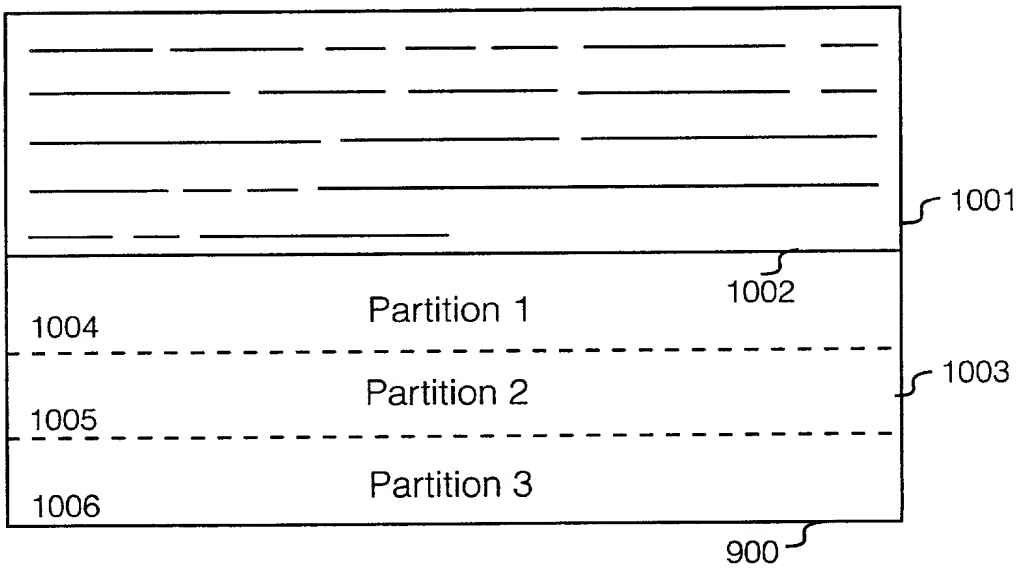

1001
1002
Partition 1
1004
Partition 2
1005
1003
Partition 3
1006
900

Fig. 10

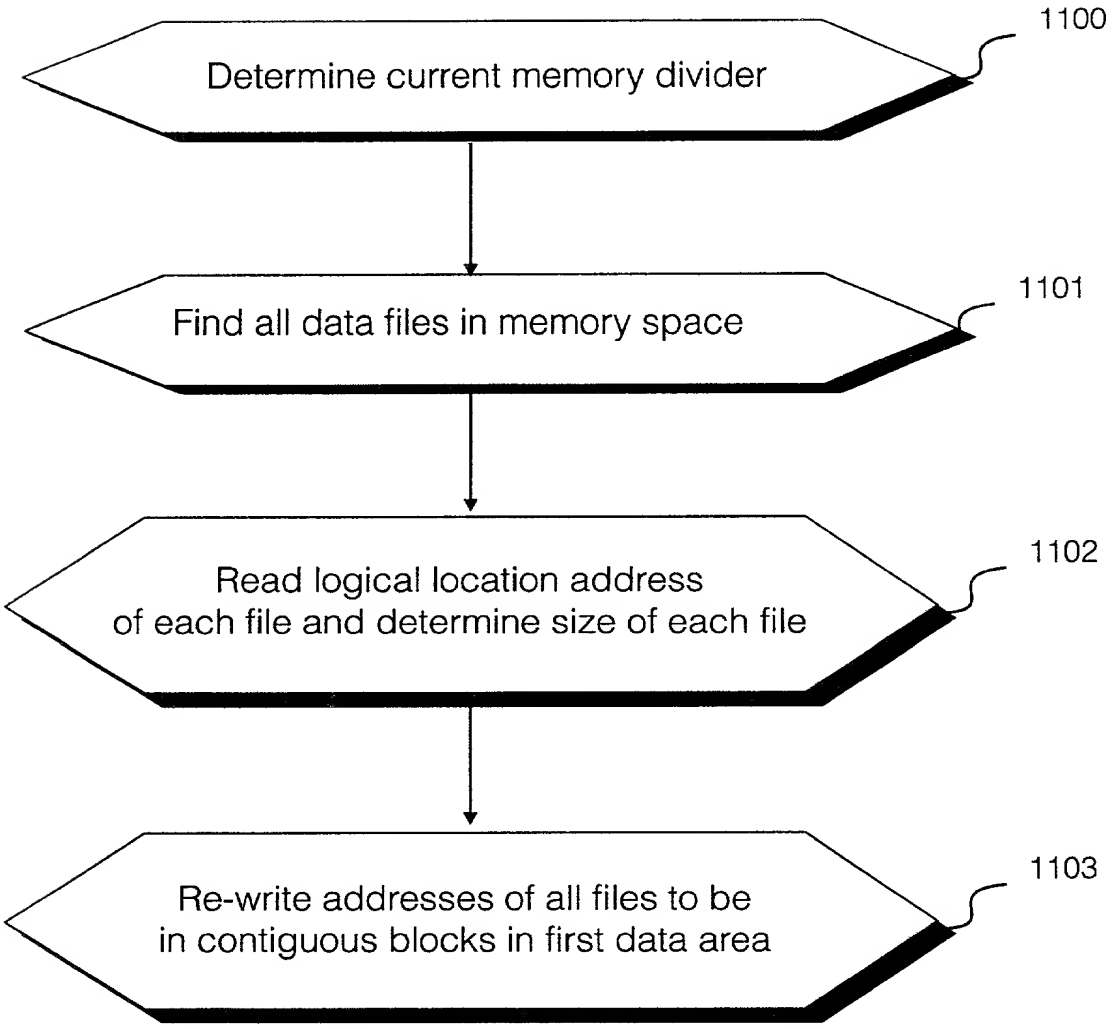

1100
Determine current memory divider
1101
Find all data files in memory space
1102
Read logical location address of each file and determine size of each file
1103
Re-write addresses of all files to be in contiguous blocks in first data area

Fig. 11

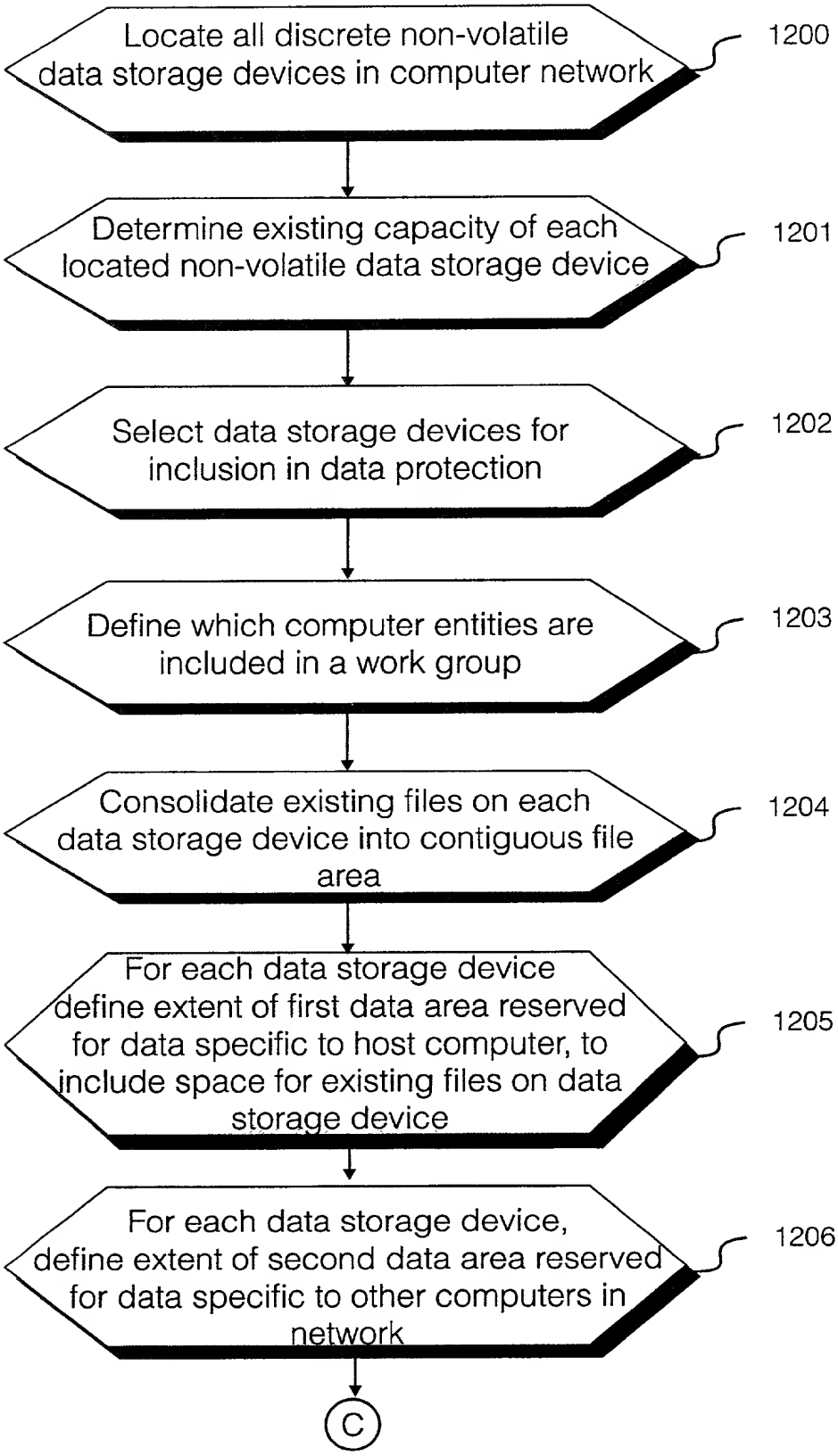

Locate all discrete non-volatile data storage devices in computer network
1200
Determine existing capacity of each located non-volatile data storage device
1201
Select data storage devices for inclusion in data protection
1202
Define which computer entities are included in a work group
1203
Consolidate existing files on each data storage device into contiguous file area
1204
For each data storage device define extent of first data area reserved for data specific to host computer, to include space for existing files on data storage device
1205
For each data storage device, define extent of second data area reserved for data specific to other computers in network
1206
C

Fig. 12

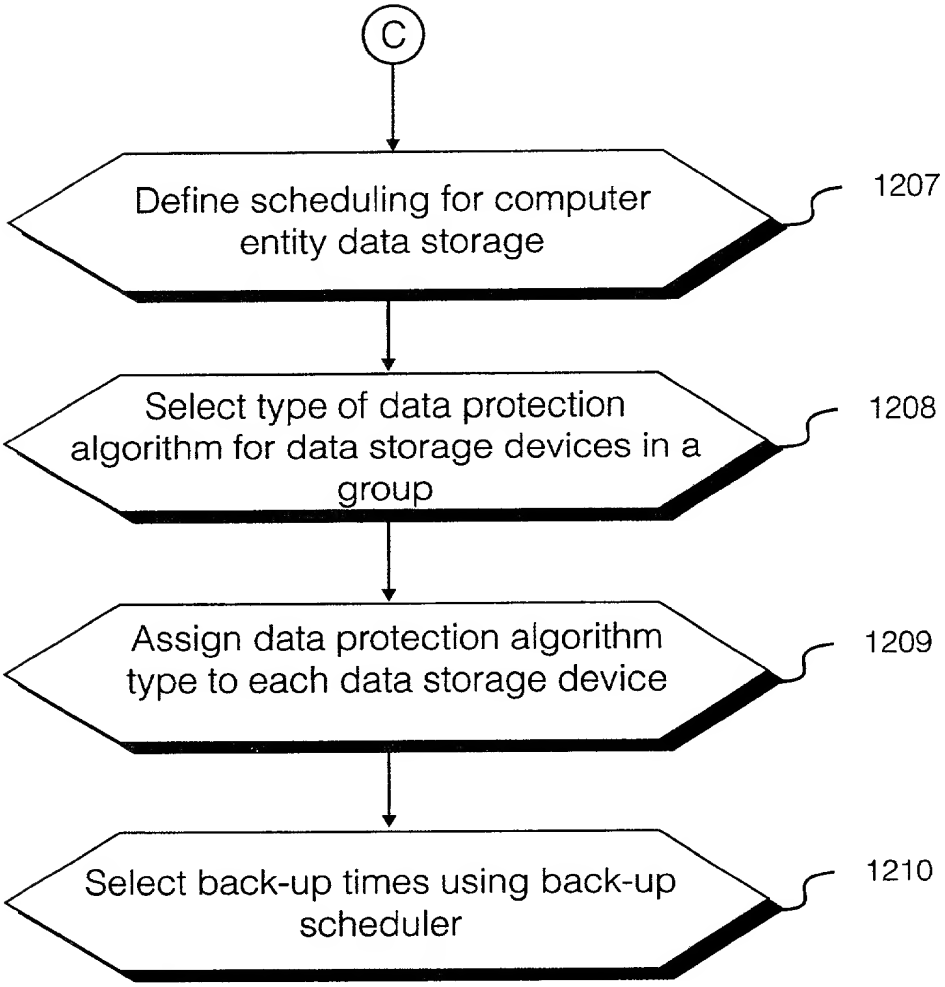

C
Define scheduling for computer entity data storage
1207
Select type of data protection algorithm for data storage devices in a group
1208
Assign data protection algorithm type to each data storage device
1209
Select back-up times using back-up scheduler
1210

Fig. 12

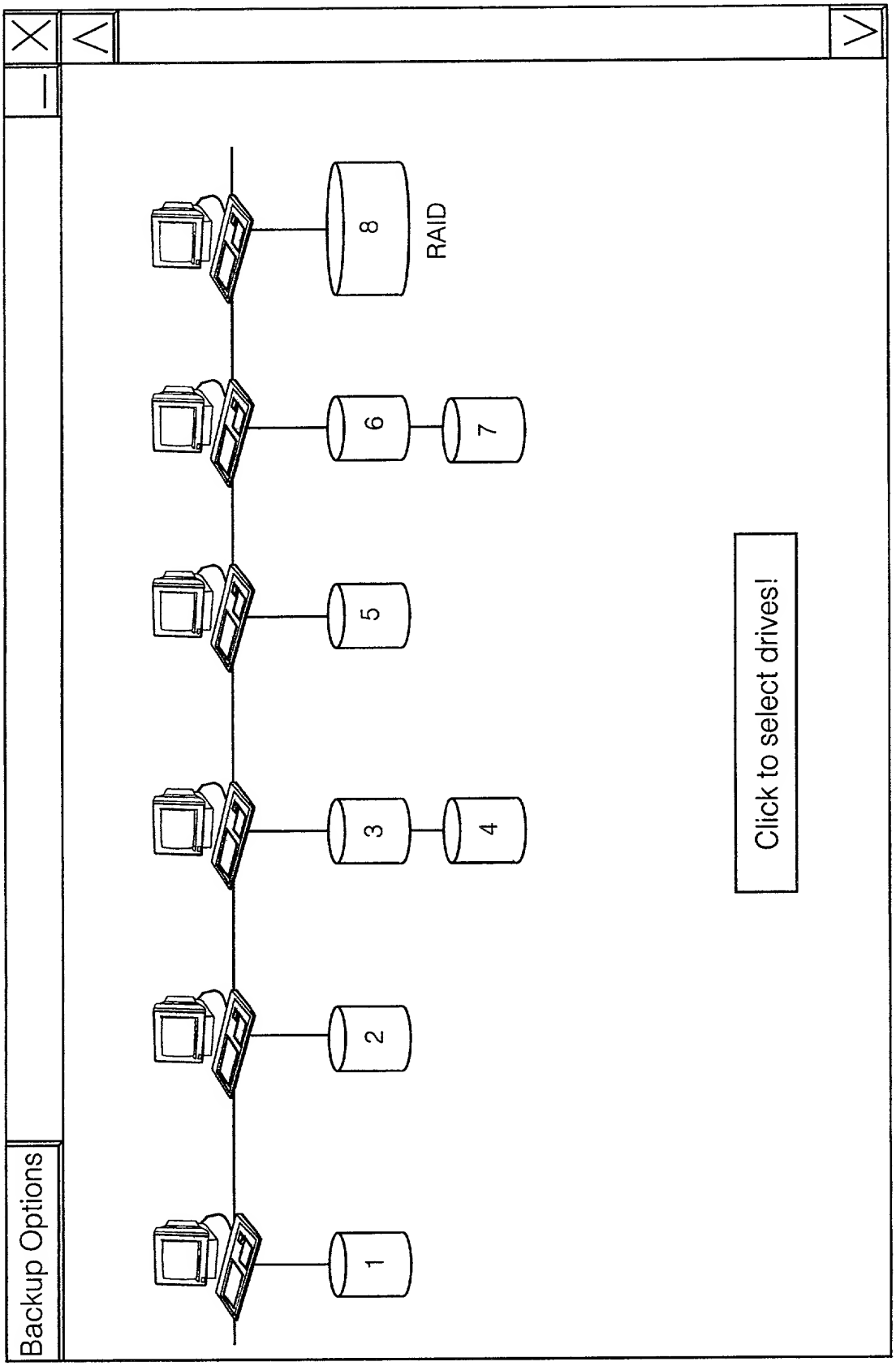
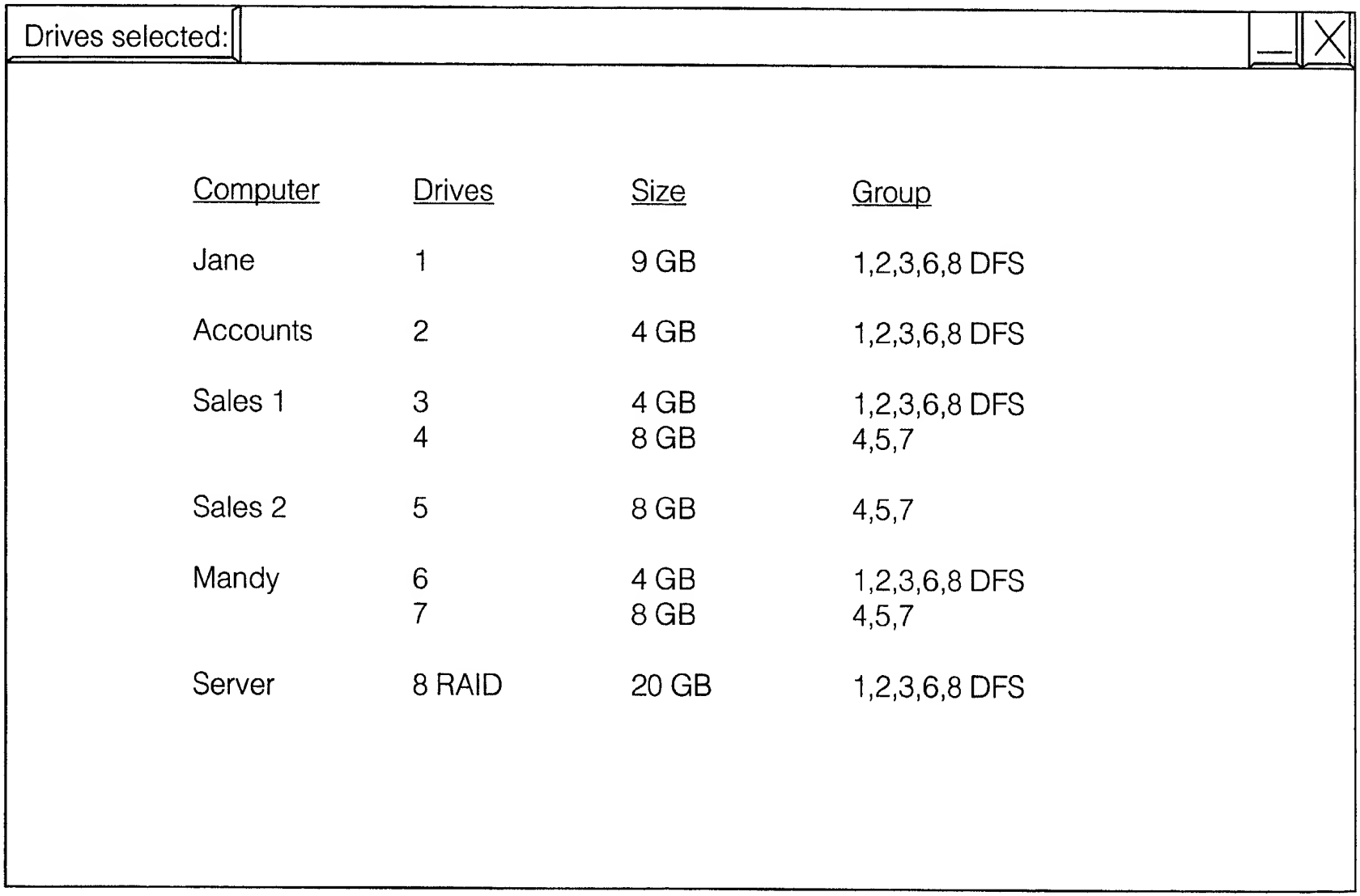


Fig. 13



Computer	Drives	Size	Group
Jane	1	9 GB	1,2,3,6,8 DFS
Accounts	2	4 GB	1,2,3,6,8 DFS
Sales 1	3	4 GB	1,2,3,6,8 DFS
	4	8 GB	4,5,7
Sales 2	5	8 GB	4,5,7
Mandy	6	4 GB	1,2,3,6,8 DFS
	7	8 GB	4,5,7
Server	8 RAID	20 GB	1,2,3,6,8 DFS

Fig. 14

Title: Utilization of Unused Disk Space on Networked Computers. Inventors: Mark Watkins, Graeme Hogg, Alastair Michael Slater, Ian Duncan
Ref: 30001673 US1

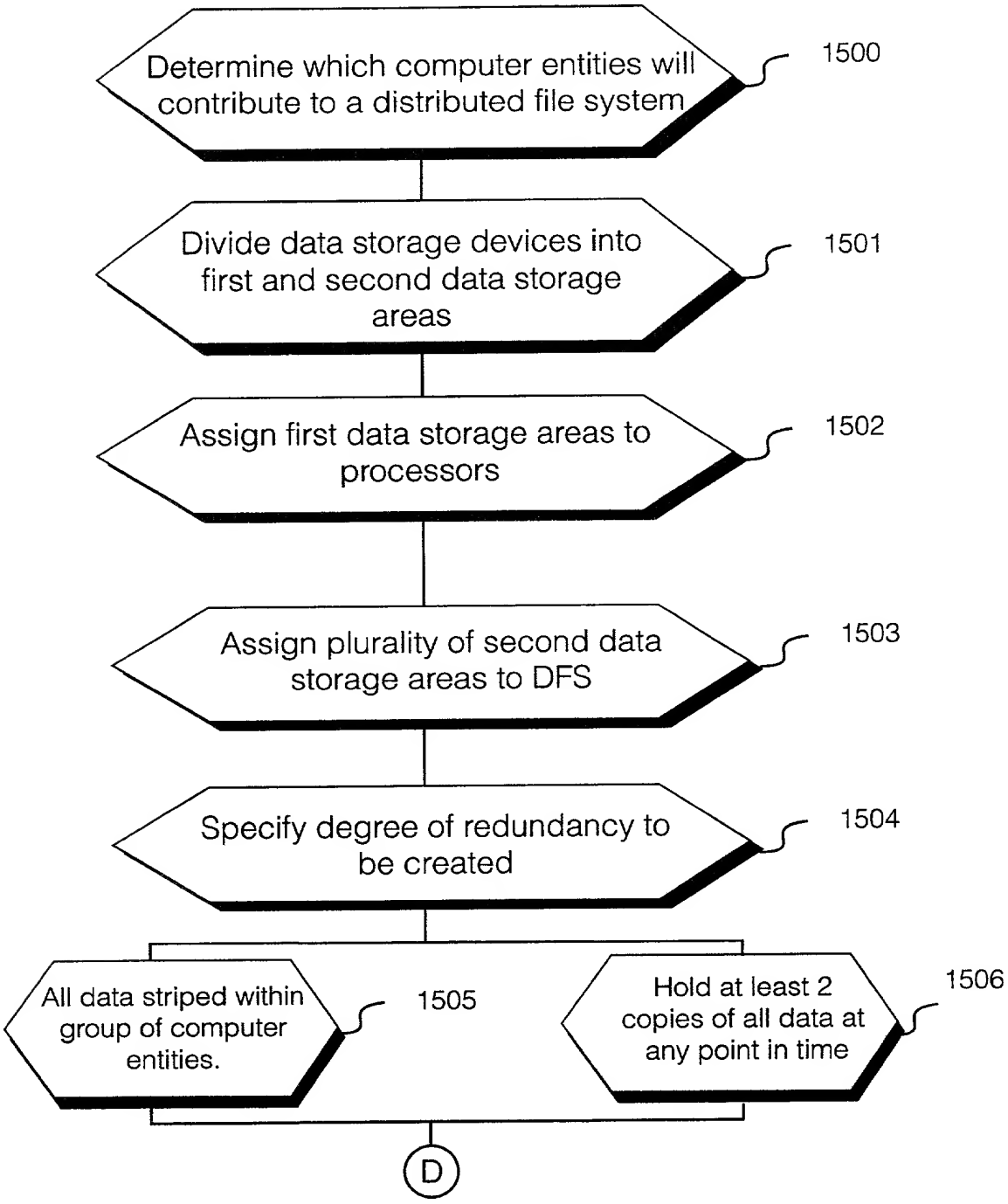

Determine which computer entities will contribute to a distributed file system
1500
Divide data storage devices into first and second data storage areas
1501
Assign first data storage areas to processors
1502
Assign plurality of second data storage areas to DFS
1503
Specify degree of redundancy to be created
1504
All data striped within group of computer entities.
1505
Hold at least 2 copies of all data at any point in time
1506
D

Fig. 15

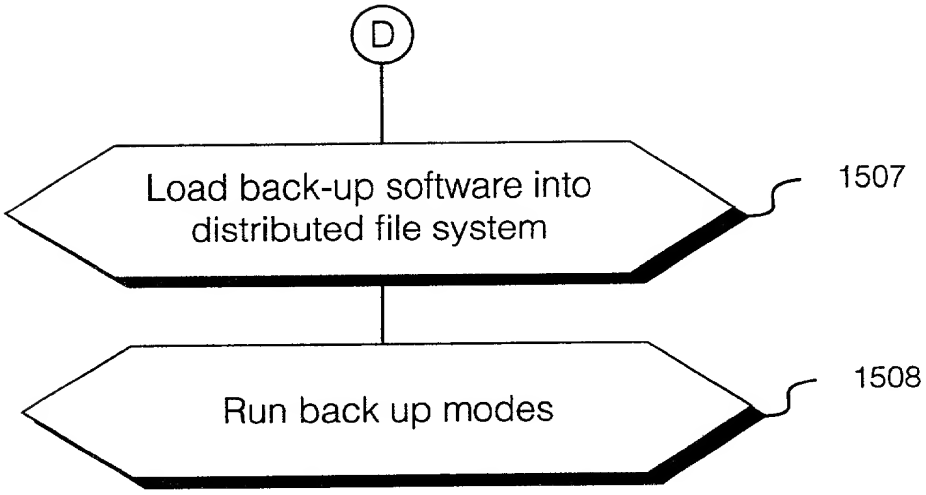

D
Load back-up software into distributed file system
1507
Run back up modes
1508

Fig. 15

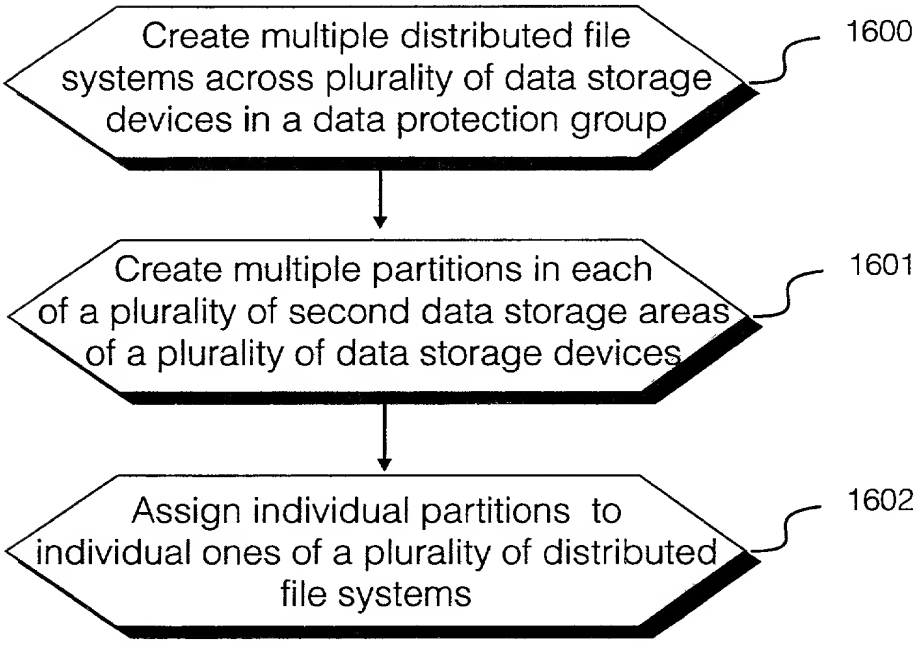

Create multiple distributed file systems across plurality of data storage devices in a data protection group
1600
Create multiple partitions in each of a plurality of second data storage areas of a plurality of data storage devices
1601
Assign individual partitions to individual ones of a plurality of distributed file systems
1602

Fig. 16